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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/539,831

02/28/2006

Partho Sarkar

10008.0100

1145

39602 7590 09/02/2009
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EXAMINER

ECHELMAYER, ALIX ELIZABETH

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

09/02/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/539,831	Applicant(s) SARKAR ET AL.	
	Examiner Alix Elizabeth Echelmeyer	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-18, 20-22, 24-26, 29, 30 and 33-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-18, 20-22, 24-26, 29, 30 and 33-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/17/05, 10/7/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. This Application is a 371 of PCT/CA03/01992, filed July 1, 2004, which claims priority to CA 2414622, filed December 17, 2002.

Information Disclosure Statement

2. The information disclosure statement filed October 7, 2008 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. No copy of WO/0369705 is provided. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claim 11 recites the limitation "second inner fuel cell". There is insufficient antecedent basis for this limitation in the claim since claims 5 and 8 do not claim a second inner fuel cell. For the purposes of examination, the claim will be interpreted as being dependent from claim 9, which recites a second inner fuel cell.
5. Claim 14 recites the limitation "second outer fuel cell". There is insufficient antecedent basis for this limitation in the claim since claims 5, 7, and 10 do not recite a

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second outer fuel cell. For the purposes of examination, the claim will be interpreted as being dependent from claim 13, which recites a second outer fuel cell.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 2, 5, 9, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Shimozu (JP 02-075167).

Shimozu teaches a series of concentric solid oxide fuel cells, wherein the air and fuel paths are arranged between every other cell, such that the inner electrode of the inner fuel cell, the outer electrode of the middle fuel cell, and the inner electrode of the third fuel cell are cathodes.

As for the limitations to the operating temperatures of the solid electrolytes, Shimozu is silent on the composition of the electrodes. However, the ordinarily skilled artisan, based on the teachings of Shimozu as well as general knowledge of the art, would find that the electrolytes are of the same composition, and would all operate at or below a first maximum temperature.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 3, 4, 7-8, 10-12, and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimozu, as applied to claims 2, 5, 9, and 13 above, and in further view of Cochran et al. (US 2004/0072054).

The teachings of Shimozu as discussed above are incorporated herein.

Shimozu fails to teach the composition of the electrolyte.

Cochran et al. teach a solid oxide fuel cell having as electrolyte yttrium stabilized zirconia, scandium stabilized zirconia, gadolinium-doped cerium oxide, and mixtures thereof ([0045]).

One having ordinary skill in the art at the time the invention was made could have substituted one or all of the known solid electrolyte materials from Cochran et al. in the fuel cells of Shimozu and the results of the substitution would have been predictable. MPEP 2141 III. If the mixture taught by Cochran et al. was used, all of the limitations of claims 3, 4, 7-8, 10-12, and 14-17 are met.

10. Claims 18, 20-22, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimozu in view of Hatano et al. (US 2002-0177026).

The teachings of Shimozu as discussed above are incorporated herein.

Shimozu teaches a base board on which the concentric tubular fuel cells are arranged (abstract).

Shimozu fails to teach the material from which the base board is made.

Hatano et al. teach a metal foam base late for use with solid oxide fuel cells ([0029]).

Hatano et al. further teach a nickel chrome metal backing sheet, which the skilled artisan would recognize to be oxidation resistant ([0057]).

Hatano et al. teach the electrode laminated to the base foamed-metal structure ([0029]).

The plate of Hatano et al. is desirable since it offers high gas-shielding and energy density at low manufacturing costs ([0006]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the plate of Hatano et al. in the system of Shimozu since the plate of Hatano et al. offers high gas-shielding and energy density at low manufacturing costs.

11. Claims 26, 29, 30, 33, 34, 36, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Browall et al. (US 2003/0224232) in view of Lazaroff et al. (US 7,067,215).

Browall et al. teach a method for making tubular solid oxide fuel cells (abstract). The method of Browall et al. involves providing a plurality of combustible cores side-by-side in a transversely spaced cluster, depositing electrodes and electrolyte, and burning

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the core to remove it, leaving an inner reactant channel ([0015], [0017]-[0020]). It is clear from Figure 2 that the spaces between the cores are filled with electrode material.

With regard to claim 29, it is seen in Figure 1 that the cores are arranged side-by-side in a single row.

Browall et al. fail to teach sintering of the layers.

Lazaroff et al. teach a method of making a fuel cell which includes sintering of deposited electrode and electrolyte layers (column 9 lines 21-31).

It would have been obvious to sinter the layers of Browall et al. such as taught by Lazaroff et al. since one having ordinary skill in the art would recognize that sintering the layers of Browall et al. such as taught by Lazaroff et al. would be desirable since it is known that sintering causes ceramic materials to become harder and denser, leaving a more durable fuel cell.

With regard to the order of the steps, it is recognized that changing the order of the steps in a method involves only routine skill in the art. MPEP 2144.04 IV C. The skilled artisan would be more than capable of determining the best order in which to deposit and sinter the electrodes and electrolyte of Browall et al. in view of Lazaroff et al.

12. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Browall et al. in view of Lazaroff et al. as applied to claim 33 above, and further in view of Satake et al. (US 5,518,829).

The teachings of Browall et al. and Lazaroff et al. as discussed above are incorporated herein.

Browall et al. in view of Lazaroff et al. teach deposition of the electrodes onto the fuel cell, but fail to teach that the outer electrode is applied by on of dip-coating and brush-painting.

Satake et al. teach depositing an electrode onto an electrolyte of a solid oxide fuel cell by brush coating (abstract; column 1 lines 48-50).

One of ordinary skill in the art could have substituted brush coating for deposition and the results would have been predictable. MPEP 2141 III.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795

Alix Elizabeth Echelmeyer
Examiner
Art Unit 1795

aee